DETAILED ACTION

1. The Amendment filed 16 March 2011 has been entered. **Claims 1-20** are pending in the application. The previous objections to the specification, drawings, and claims and rejections of claims under 35 U.S.C. 112, second paragraph, except those maintained below, are withdrawn in light of Applicant's amendments to the specification, drawings, and claims. Response to applicant's arguments can be found at the end of this office action.

Drawings

2. The drawings were received on 16 March 2011. These drawings are acceptable.

Claim Objections

3. **Claim15** is objected to because of the following informalities:

In **claim 15**, either the word "at" or the word "to" should be deleted from the phrase "connected to at an end of the at least one link member" (line 6).

Appropriate correction is required.

Claim Rejections - 35 USC § 112

4. The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

5. **Claims 2, 6, 9-13, and 17** are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

6. **Claim 2** recites the limitation "the drive power transmitting means" in lines 2 and 3. There is insufficient antecedent basis for these recitations in the claim.

7. **Claim 6** recites the limitation "the drive power transmitting means" in lines 2 and 3. There is insufficient antecedent basis for these recitations in the claim.

8. **Claims 9, 12, and 13** recites the functional limitation that "the magnitude of a moment required for starting the bending action of the second articulation portion is larger than a moment required for the bending action of the first articulation portion". This functional recitation is indefinite because it is not supported by recitation in the claim of sufficient structure to accomplish the function. **Claims 10-11 and 14** are rejected as being dependent upon rejected claims 9, 12, and 13.

9. **Claim 10** recites the functional limitation that "a force generated in a direction along the rotary shaft is increased between the first coupling portion and the second coupling portion accompanied by the bending action of the second articulation portion". This functional recitation is indefinite because it is not supported by recitation in the claim of sufficient structure to accomplish the function. **Claim 11** is rejected as being dependent upon rejected claim 10.

10. **Claim 17** recites the limitation "the first joint portion has a projecting portion" in line 2. It is unclear whether this projecting portion is provided as the projection included with the first joint portion as required by claim 15, or in addition thereto, rendering the

claim indefinite. For examination purposes, references to the "projecting portion" in claim 17 shall be read as - - projection - -.

Claim Rejections - 35 USC § 102

11. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

12. **Claims 9 and 12-14** are rejected under 35 U.S.C. 102(b) as being anticipated by Yamashita et al ("Multi-Slider Linkage Mechanism for Endoscopic Forceps", Oct. 2003).

It is noted that the term "movable means", as claimed, does not illicit interpretation of the claims under 35 USC 112, 6th paragraph for failing to meet the requirements for such an interpretation of the claim language. See MPEP 2181 and arguments section of this Office Action.

Yamashita et al disclose a bending action member including a movable means having a plurality of articulation portions and being constructed to be bendable (bending mechanism), a drive power generating means (DC-servomotor), a drive power transmitting means (linkages), and wherein the movable means includes first, front-end side and second, rear-end side articulation portions constructed to be bendable to the same side, adjoining each other, and are constructed such that a bending action at the second articulation portion starts after a bending action at the first articulation portion

(see figure 1) and the magnitude of a moment required for starting the bending action of the second articulation portion is larger than a moment required for bending action of the first articulation portion (the moment to start bending at the second portion is greater than that of the first portion, since the forces required for bending at the second articulation portion moves both the first *and* second articulation portions which would require more force than moving just one of the articulation portions).

Yamashita et al further disclose the bending action member including a pair of forceps members substantially as claimed (see figure 7);

13. **Claim 19** is rejected under 35 U.S.C. 102(b) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over Yamashita et al ("Multi-Slider Linkage Mechanism for Endoscopic Forceps", Oct. 2003).

Should Yamashita et al be found to not anticipate claim 19, an alternative rejection under 35 USC 103(a) is provided below over Yamashita et al in view of Barry (US Patent Number 5,928,136).

Regarding **claim 19**, Yamashita et al disclose the device substantially as claimed including the drive power transmitting means including a first joint portion (at the interface with the motor) and the drive generating means having a second joint portion (at the interface with the linkages) which are provided to be connectable and separable; wherein the coupling between the first and second joint portions is executed after the bending action member and the actuator are jointed together (since the forceps shaft contacts the distal portion of the grip of the actuator and, as of that point, is to be

considered to be jointed to the actuator) before coupling the wires to the motor; see figures 5 and 9; page 2580, left column, first paragraph), and the first and second joint portions are capable of separation by a separating action of the bending action member and the actuator.

Claim Rejections - 35 USC § 103

14. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

15. **Claims 1-8** are rejected under 35 U.S.C. 103(a) as being unpatentable over Yamashita et al ("Multi-Slider Linkage Mechanism for Endoscopic Forceps", Oct. 2003) in view of Burbank et al (US Patent Number 5,425,737).

Yamashita et al disclose a bending action member including a movable means with a distal bendable portion (bending mechanism), a motor (DC-servomotor), a link mechanism (linkages) that transmits drive power generated by the motor to the movable means, and a cylindrical frame (not labeled, extending between the bending mechanism and the DC-servomotor) connected to the movable means and containing a hollow portion accommodating the transmitting means (see figures 1 and 5; page 2579, right column, first paragraph).

The device of Yamashita et al discloses the invention substantially as claimed except for an air-tight link guide portion provided in the hollow portion of the cylindrical

frame that holds and guides the link mechanism as the link mechanism moves to transmit the drive power to the movable means. Burbank et al teach providing a bending action member with an air-tight link guide portion in a hollow portion of a cylindrical frame (88) that holds and guides a link mechanism as the link mechanism moves to transmit drive power to a movable means (14; see figures 3-15; column 6, lines 31-46). It would have been obvious to a person having ordinary skill in the art at the time of the invention to modify the device of Yamashita et al to include an air-tight link guide portion, as taught by Burbank et al, since Burbank et al teach that such a configuration maintains an airtight seal (column 6, lines 31-46) which would prevent the loss of air or fluid from a surgical site through the device.

Regarding **claims 2 and 6**, Burbank et al teach the air-tight member making a sliding contact with the link mechanism when drive power is transmitted to the movable means by the link mechanism (column 6, lines 31-46).

Regarding **claims 3-4 and 7-8**, Yamashita et al further disclose the movable means including a plurality of articulation portions and adjoining two articulation portions are constructed such that a bending action at an articulation portion on a rear end side starts a bending action after a bending action an articulation portion on a front end side ends (see figure 1); and the bending action member including a pair of forceps members substantially as claimed (see figure 7).

16. **Claims 10-11** are rejected under 35 U.S.C. 103(a) as being unpatentable over Yamashita et al ("Multi-Slider Linkage Mechanism for Endoscopic Forceps", Oct. 2003) in view of Kuehn et al (US Patent Number 6,743,239).

The device of Yamashita et al discloses the device substantially as claimed, including first and second frame members having respective first coupling and second joint portions and being jointed with a common rotary shaft (see figures 1 and 2), except for a force generated in a direction along the rotary shaft being increased between the coupling and joint portions accompanied by the bending action of the second articulation portion. Kuehn et al teach providing bending frame members with means (notches (374) and prongs) that increase a force generated in a direction along, or at a location on, the rotary shaft (the notches (374) increase a rotary force produced along the rotary shaft during bending action) accompanied by bending action of an articulation portion (see figure 4; column 12, lines 23-31) in order to facilitate holding a bending member in a certain position. It would have been obvious to a person having ordinary skill in the art at the time of the invention to modify the device of Yamashita et al to include means that increase a force generated in a direction along the rotary shaft, as taught by Kuehn et al, in order to facilitate the bending action member to maintain a desired position during a procedure without requiring manipulation from a user.

Regarding **claim 11**, as the notches and prongs are tapered to complement each other to form a ratcheting mechanism (column 12, lines 23-31) the contact faces of the notches and prongs are considered to be tapered forward and to follow each other when the movable means is not bent.

17. **Claims 15-17** are rejected under 35 U.S.C. 103(a) as being unpatentable over Yamashita et al ("Multi-Slider Linkage Mechanism for Endoscopic Forceps", Oct. 2003) in view of Barry (US Patent Number 5,928,136).

Yamashita et al disclose a bending action member including a movable means with a distal bendable portion (bending mechanism), a drive power generating means (DC-servomotor), a drive power transmitting means (linkages) constructed of at least one link member, and a first joint portion connected to at an end of the at least one link member (at the interface with the motor), the drive power generating means being constructed to transmit the drive power from the drive power generating means to the movable means when the first joint portion is connected to the drive power generating means and to not transmit the drive power from the drive power generating means to the movable means when the connection between the first joint portion and the drive power generating means is released (such as when separated for sterilization purposes; see figure 5).

The device of Yamashita et al discloses the invention substantially as claimed except for the first joint portion including a projection that can be releasably connected to the drive power generating means and, further, the drive power generating means including a second joint portion including an elastic body urging substantially perpendicularly to the transmitting direction of the drive power and having a fitting hole. Barry teaches providing a member with a first joint portion (20) including a projection (25) to connect with a second joint portion including an elastic body (21) including a

fitting hole (24; see figure 3; column 3, lines 7-55). It would have been obvious to a person having ordinary skill in the art at the time of the invention to modify the device of Yamashita et al to have the transmitting means first joint portion include a projection and the power generating means include a second joint portion including an elastic body with a fitting hole, as taught by Barry, since Barry teaches that such a joint configuration has minimal thickness (column 1, line 39-45) which would facilitate fitting the joint within the actuator housing the motor in the device of Yamashita et al.

Regarding **claim 16**, Yamashita et al further disclose the movable means including a plurality of articulation portions and including first, front-end side and second, rear-end side articulation portions constructed to be bendable to the same side, adjoining each other, and are constructed such that a bending action at the second articulation portion starts after a bending action at the first articulation portion (see figure 1).

18. **Claim 18** is rejected under 35 U.S.C. 103(a) as being unpatentable over Yamashita et al ("Multi-Slider Linkage Mechanism for Endoscopic Forceps", Oct. 2003) in view of Barry (US Patent Number 5,928,136).

Yamashita et al disclose an actuator constructed to be capable of engaging/disengaging a bending action member including a movable means with a distal bendable portion (bending mechanism), including a drive power generating means (DC-servomotor), a first joint portion connected to at an end (at the interface with the motor) of a link member (linkages) that transmits the drive power to the movable

means, a second joint portion connected to the drive power generating means (at the interface with the linkages).

The device of Yamashita et al discloses the invention substantially as claimed except for the first joint portion including a projecting portion and the drive power generating means including a second joint portion including an elastic body having a fitting hole and being elastically urged substantially perpendicularly to the transmitting direction of the drive power and. Barry teaches providing a member with a first joint portion (20) including a projection (25) to connect with a second joint portion including an elastic body (21) including a fitting hole (24; see figure 3; column 3, lines 7-55). It would have been obvious to a person having ordinary skill in the art at the time of the invention to modify the device of Yamashita et al to have the transmitting means first joint portion include a projection and the power generating means include a second joint portion including an elastic body with a fitting hole, as taught by Barry, since Barry teaches that such a joint configuration has minimal thickness (column 1, line 39-45) which would facilitate fitting the joint within the actuator housing the motor in the device of Yamashita et al.

As there is not explicit structure preventing such a relationship between the first and second joint portions in the modified device of Yamashita et al in view of Barry, the second joint portion is capable that the second joint portion may be initially advanced substantially linearly by the drive power of the drive power generating means without the projecting portion being fitted into the fitting hole, and the projecting portion being arranged such that the second joint portion is capable of connecting to the first joint

portion by advancing the second joint portion substantially linearly until the projection portion is fitted into the fitting hole while an urging force is applied to the first joint portion by the elastic body.

19. **Claims 19-20** are rejected under 35 U.S.C. 103(a) as being unpatentable over Yamashita et al ("Multi-Slider Linkage Mechanism for Endoscopic Forceps", Oct. 2003) in view of Barry (US Patent Number 5,928,136).

Yamashita et al disclose a manipulator including a bending action member including a movable means with a distal bendable portion (bending mechanism), a drive power transmitting means (linkages), and an actuator including a drive power generating means (DC-servomotor; see figures 1 and 5; page 2579, right column, first paragraph).

The device of Yamashita et al is not explicitly disclosed with the drive power transmitting means including a first joint portion including a projecting portion and the drive power generating means including a second joint portion including an elastic body urging substantially perpendicularly to the transmitting direction of the drive power and having a fitting hole. Barry teaches providing first and second joint portions to connected members with the first joint portion (20) including a projecting portion (25) and the second joint portion including an elastic body (21) including a fitting hole (24; see figure 3; column 3, lines 7-55). It would have been obvious to a person having ordinary skill in the art at the time of the invention to modify the device of Yamashita et al to have the transmitting means include a first joint portion including a projecting

portion and the power generating means include a second joint portion including an elastic body with a fitting hole, as taught by Barry, since Barry teaches that such a joint configuration has minimal thickness (column 1, line 39-45) which would facilitate fitting the joint within the actuator housing the motor in the device of Yamashita et al.

As there is not explicit structure preventing such a relationship between the first and second joint portions in the modified device of Yamashita et al in view of Barry, the second joint portion is capable that the second joint portion may be initially advanced substantially linearly by the drive power of the drive power generating means without the projecting portion being fitted into the fitting hole, and the projecting portion being arranged such that the second joint portion is capable of connecting to the first joint portion by advancing the second joint portion substantially linearly until the projection portion is fitted into the fitting hole while an urging force is applied to the first joint portion by the elastic body.

Response to Arguments

20. Applicant's arguments with respect to **claims 1-8, 12-17, and 19** have been considered but are moot in view of the new ground(s) of rejection.

21. Applicant's arguments filed 16 March 2011 have been fully considered but they are not persuasive.

22. Regarding Applicant's arguments concerning the rejections of **claims 9, 12, and 13** under 35 USC 112, 2nd paragraph, the recitation of the "movable means" does not

meet the requirements for an interpretation under 35 USC 112, 6th paragraph.

According to MPEP § 2181:

> A claim limitation will be presumed to invoke 35 U.S.C. 112, sixth paragraph, if it meets the following 3-prong analysis:
>
> (A) the claim limitations must use the phrase "means for" or "step for;"
>
> (B) the "means for" or "step for" must be modified by functional language; and
>
> (C) the phrase "means for" or "step for" must not be modified by sufficient structure, material, or acts for achieving the specified function.

As the claims do not use the phrase "means for" modified by functional language and the "movable means" is modified by sufficient structure (i.e., the provision of a plurality of articulation portions and configurations of the first and second articulation portions) for achieving the specified function, the recitation of "bendable means" in the claim is not presumed to invoke interpretation under 35 USC 112, 6th paragraph, and there is insufficient structure recited in the claim to perform the claimed function. Therefore, the rejections of these claims are maintained.

23. Regarding Applicant's arguments concerning the rejection of **claims 10-11** under 35 USC 112, second paragraph, Applicant is incorrect in presuming that claim limitations receive interpretation of claim language under 35 USC 112, 6th paragraph when insufficient structure is presented to perform a claimed function. Claims are given the broadest reasonable interpretation unless interpretation under 35 USC 112, 6th paragraph is invoke, and a claim is only interpreted in view of 35 USC 112, 6th

paragraph when the claim meets the requirements for an invocation of interpretation under the statute (see MPEP 2181). There is no means-plus-function language in the claim to invoke 35 USC 112, 6th paragraph. Applicant is permitted to claim the invention broadly, but the claim must particularly point out and distinctly define the metes and bounds of the subject matter that will be protected by the patent grant. As there is insufficient structure recited in the description of the first and second coupling portions to perform the function of "a force generated in a direction along the rotary shaft is increased between the first coupling portion and the second coupling portion accompanied by the bending action of the second articulation portion", the rejection of the claim under 35 USC 112, 2nd paragraph is maintained.

With respect to applicant's argument concerning the "forward tapered shapes" of the coupling portions, it is noted that the features upon which applicant relies (i.e., the structural relationships between the tapered portions to increase contact pressure or friction torque) are not recited in the rejected claim(s). Although the claims are interpreted in light of the specification, limitations from the specification are not read into the claims. See *In re Van Geuns*, 988 F.2d 1181, 26 USPQ2d 1057 (Fed. Cir. 1993).

24. Regarding Applicant's arguments concerning the rejection of **claims 9 and 12-14** under 35 USC 102, Applicant argues that the Yamashita reference does not discuss the magnitude of a moment to start bending, but as stated in the rejection the moment to start bending at the second portion is greater than that of the first portion, since the forces required for bending at the second articulation portion moves both the first *and*

second articulation portions which would require more force than moving just one of the articulation portions. More mass is required to move (i.e., the masses of the first and second articulation portions) when the second articulation portion is moved, so the moment of inertia increases and more force is required to move the second articulation portion. Therefore, since bending the second portion requires moving the mass of the first portion *and* the second portion, the magnitude of the moment to bend the second articulation portion is greater than the moment required to bend the first articulation portion, which only moves the mass of the first portion.

25. Regarding Applicant's argument concerning the rejection of **claim 19** under 35 USC 102, as Applicant has noted, the Yamashita et al referenced discloses the unsterilizable portion of the device (containing the actuator with drive power generating means) as removable from the sterilizable portion of the device (containing the bending action member and drive power transmitting means). Although silent about the details of the coupling structure, there must be an interface on the drive transmitting means (in the sterilizable portion) and on the drive power generating means (in the unsterilizable portion) in order to allow for coupling of the two portions for use of the device. Therefore, as Applicant has not provided any specific structure for the first joint portion or second joint portion, the interfaces on the drive transmitting means and the drive power generating means meet the limitations of the claim. Further, since the forceps shaft contacts the distal portion of the grip of the actuator and, as of that point, is to be considered to be jointed to the actuator, the device of Yamashita meets the limitation of

wherein the coupling between the first and second joint portions is executed after the bending action member and the actuator are jointed together.

26. Regarding Applicant's arguments concerning the combination of the Yamashita et al and Barry references,

In response to applicant's argument that the elastic body taught by Barry is not urged in a direction substantially perpendicular to the transmitting direction of the drive power and the projecting portion and fitting hole being removable, a recitation of the intended use of the claimed invention must result in a structural difference between the claimed invention and the prior art in order to patentably distinguish the claimed invention from the prior art. If the prior art structure is capable of performing the intended use, then it meets the claim. As Barry shows the elastic body extending parallel to a longitudinal axis of the device, the elastic body is capable of being urged perpendicularly to the transmitting direction of the drive power (which is parallel to the longitudinal axis of the modified device of Yamashita in view of Barry) and the two joint portions are capable of being removed from one another. Also, although the Barry reference discloses joint portions joining vertebra in an device, one having ordinary skill in the art would have found it obvious to apply the teaching of a first joint portion with a projecting portion to the link member and a second joint portion with an elastic body and fitting hole to the drive power generating means in the device of Yamashita to provide a joint configuration with minimal thickness (column 1, line 39-45) which would facilitate fitting the joint within the actuator housing the motor in the device of Yamashita et al.

Further, as one of ordinary skill in the art would recognize the benefit of separable joint portions (i.e., for sterilization purposes) and that Barry recognizes the selectability of materials having different modulus of elasticity, it is within ordinary skill in the art to combine the teachings in a way to optimize separability characteristics of the joint portions in the modified device of Yamashita et al in view of Barry.

And since Yamashita et al disclose the forceps shaft contacts the distal portion of the grip of the actuator and, as of that point, is to be considered to be jointed to the actuator, the modified device of Yamashita et al in view of Barry meets the limitation of wherein the coupling between the first and second joint portions is executed after the bending action member and the actuator are jointed together.

Conclusion

27. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of

the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

28. Any inquiry concerning this communication or earlier communications from the examiner should be directed to JONATHAN A. HOLLM whose telephone number is (571) 270-7529. The examiner can normally be reached on Monday - Friday 8:30-5:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, GARY JACKSON can be reached on (571) 272 - 4697. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/JAH/

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